

VI. *On a new Genus of the Order Rodentia.* By Joshua Brookes, Esq., F.R.S. and L.S. Communicated by the Zoological Club of the Linnean Society.

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THE science of Natural History is of so unbounded an extent, that perhaps I may be allowed, comparatively speaking, to say, that scarcely a day passes without an opportunity being afforded to zoologists of bringing to light unknown instances of its latent treasures.

The animal which I am at present about to describe has been in my possession for several years ; and although there is strong evidence of its being new to science, as far as relates to a knowledge of its real structure, yet, from a variety of circumstances, I have neglected to avail myself of the means so long afforded me ; and possibly now it may only be in consequence of the approaching dispersion of my collection that a stimulus is given to exertions, which otherwise might have remained dormant.

The individual in question, which appears to be unique, was obtained, when recently dead, from Mr. Cross, in whose Vivarium at Exeter Change it had been seen while living, and especially noticed, both by M. de Blainville and by M. F. Cuvier. Each of these distinguished naturalists has described its general characters and habits ; but, unacquainted with its real structure, they have failed in referring it to its correct situation in Nature. By each of them it has been erroneously placed among the Jerboas, under the name of *Dipus maximus*. The latter
author,

author, indeed, appears to have doubted the propriety of this location, and mentions with evident regret, that the loss of the remains of the animal had prevented our becoming acquainted with its organization, and ascertaining precisely its characters. Fortunately, however, the animal, although obscured from notice during so long a period, is yet in a condition for accurate and minute examination.

The description of its preserved skin and skeleton I have now the honour of presenting to the notice of the Society; and from the structure of the latter especially, it will be evident that it must be referred to a new genus, to which I propose to give the name of *Lagostomus*. The form of the teeth, on which so much stress is justly laid in characterizing genera, differs essentially from that exhibited by all the other *Rodentia*; from which it is also distinguished not only by the number of its toes, but by various other particulars of its osteology, which I shall now proceed rapidly to describe, assuming occasionally as a point of comparison the skeleton of the *Dipus Sagitta*, with which it has been generically confounded.

The upper surface of the cranium in *Lagostomus* exhibits the usual form of that of the *Rodentia*, its sides being nearly parallel, and its occipital breadth scarcely exceeding its breadth immediately anterior to the orbits. In *Dipus*, on the contrary, the outline is decidedly triangular, arising from the very considerable dilatation of its hinder part, occasioned by the extraordinary development of the mastoid processes of the temporal bones, which are extremely delicate, and possess, as in man, a cellular structure*.

The

* The Egyptian Jerboas being known to domiciliate themselves under bushes frequented by the *Cerastes*, so that it frequently, or perhaps generally occurs, that where the one, there the other is also found; this particular osseous extension may be destined by Nature, to give increased sensitiveness to the auditory organ, for the greater security of the animal. In the *Chlamyphorus truncatus* there are two somewhat similar osseous

The occipital spine in the Jerboa is very trifling: a singular circumstance, when considered in connection with the upright position continually assumed by that animal; while in *Lagostomus* it is most strongly and decidedly pronounced. In both, the orbit is separated from the temporal fossa by a broad and strong bony process;—a structure which occurs also in *Echinothrix dorsata*, and in *Cælogenus Agouti*; but not in *Lepus*, *Arctomys*, *Castor*, and many others of the *Rodentia*. The zygomatic arch is weak posteriorly.

The incisor teeth, as in most of the genera of this order, are two in number in each jaw; they are long, and protrude considerably, almost equalling in this respect those of *Orycterus maritimus*, and exceeding those of any other species, with that exception: those of the lower jaw are rather the longest, and are grooved along the middle line of their outer surface. The molar teeth are four in number on each side of each of the jaws: those of the lower jaw are placed in a very oblique direction forwards and outwards; each of them is composed of two equal portions, distinctly surrounded by a margin of enamel, and closely united, so as to give the appearance of two single flat teeth intimately ossified together laterally. The three anterior molar teeth of the upper jaw very much resemble those of the lower, but are placed somewhat less obliquely: the fourth, or hinder one, differs in having added to it a third portion, which is rather smaller than the others, and is rounded in its posterior outline. In the Jerboa the molar teeth, it is almost unnecessary to remark, are only three in number on each side of the lower jaw: the structure of their crowns, in which the circumvolutions of the enamel are so complicated

tumours situated just above the orbits, the use and connections of which are unknown, but which may be probably intended for an extension of the olfactory organ, or possibly for a more elaborate diffusion of sound in its subterranean pursuits.

as scarcely to be capable of scientific description, is strongly opposed to the very simple form of those of *Lagostomus*, which present only three parallel lines of enamel, separated by two intervening portions of the osseous part of the tooth.

The rami of the lower jaw are arched, broad, and strong, and exhibit very distinctly on their under surface the roots of the molar teeth, and also the course of the incisors within the bone: the angle is very much produced posteriorly: the plate is broad, and is deeply grooved above, behind the molar teeth: the coronoid process is very acute; the condyle elongated from before backwards, and the glenoid cavity large, and extended considerably in the direction of the condyle.

As all the *Mammalia* have seven cervical vertebræ, with the exception of the Sloth, which has nine, there cannot be any necessity for referring to those bones for numerical comparison with those of other animals. The number of ribs, and consequently that of the dorsal vertebræ, is twelve on each side; that of the lumbar, seven: in both these particulars *Lagostomus* agrees with the Jerboa. The sacral vertebræ of *Lagostomus* are three, and the caudal twenty.

The anterior extremity is comparatively shorter than in the greater number of the *Rodentia*, but is longer and stronger than in the Jerboa. The clavicle is complete. The scapula is rather delicate; its spine is but slightly elevated; and the acromion is slender, flattened, and considerably elongated, equalling in length the remaining portion of the spine. The os brachii is strong, has a considerable tubercle at its outer surface somewhat below the head of the bone, and exhibits a tendency to expand into a ridge (the processus deltoides). The condyles are lengthened transversely, and are widely separated. The radius is about one-fourth longer than the os brachii, and it inclines towards the ulna, which is ankylosed anteriorly with it through about

two-thirds of its length, by the ossification of the interosseous ligament. The toes are four in number, terminated by small claws, and the skeleton exhibits not the slightest rudiment of a thumb. In the Jerboa the scapula is still more delicate; the acromion, though slender, does not exceed one-third of the length of the spine; the os brachii is weak, and its deltoid process a simple but strong tubercle; the radius is twice as long as the arm-bone, and there is a marked rudiment of a thumb, which is visible even in the living animal.

The general appearance of the pelvis in *Lagostomus* is delicate; it is comparatively narrow, and is wider in its transverse than in its sacro-pubal diameter: its position is extremely vertical, whence it appears incapable of affording much support to the abdominal viscera when the animal assumes the upright position. The ossa pubis are but little produced; their symphysis is slender and much elongated, and the obturator foramen is consequently enormously large.

The ilia are long and narrow, and their crista, which is blunt, is little expanded. The ossa femoris are straight, strong, and without ridges; they are furnished, like those of the rabbit, squirrel, and some other animals, with three trochanters, the ordinary trochanter major and trochanter minor, with a trochanter externus, situated a little below the larger process. The tibia and fibula are nearly half as long again as the femur; the fibula is complete, extending downwards, and forming the malleolus externus. The os calcis is strong, and elongated backwards: the metatarsal bones are three; they are strong; the middle one is not quite one-half of the length of the tibia: at the tarsal extremity of the outer one there is a small somewhat curved and obtusely-pointed tubercular elongation directed backwards, as though it were intended as a fulcrum to give additional security to the foot in leaping. A similar formation

may be noticed in the squirrel and *Pteromys*. The toes are three, the middle one being the longest and the inner one the shortest.

From this the hinder extremity of *Dipus* differs most essentially. Its femur is arched, with the convexity forwards, and is only half the length of the tibia. The fibula is short, and extends to just below the middle of the tibia, where these bones are firmly ossified together: the metatarsal bone, which is about two-thirds of the length of the tibia, is single, and is terminated by three nearly equal toes, the lower part of the limb bearing in the skeleton a striking resemblance to that of a small tridactylous wader.

To this outline of the more remarkable particulars exhibited by the skeleton of *Lagostomus*, and of the numerous and important differences which exist between it and that of the Jerboa, a few observations may be added respecting its relation with those of other rodent quadrupeds nearly approaching to it in size.

The <i>Lagostomus</i> has 12 ribs, and consequently twelve dorsal	
Jerboa . . . 12 ———	[vertebræ.]
Squirrel . . . 12 ———	
Rabbit . . . 12 ———	
Marmot . . . 13 ———	
Coypus . . . 13 ———	
Agouti . . . 13 ———	
Urson . . . 14 ———	
Capromys . . . 16 ———	

The <i>Lagostomus</i> . . . 7 lumbar vertebræ.	
Jerboa . . . 7 ———	
Squirrel . . . 7 ———	

The

The Rabbit . . .	7	lumbar vertebræ.
Marmot . . .	7	————
Urson . . .	6	————
Agouti . . .	6	————
Coypus . . .	6	————
Capromys . .	6	————

Hence it appears, that in the number of the ribs, and of the lumbar vertebræ, the *Lagostomus* agrees with the Jerboa, the Squirrel, and the Rabbit. From the former of these its distinctions have been already pointed out. From the Squirrel it differs amply in the want of the rotatory motion of the bones of the fore-arm, and in the number of the toes, which in that animal are five upon each foot. In the Rabbit the fibula is ankylosed with the tibia a little below its middle, as in the Jerboa,—a circumstance which takes place also in the Rat. From the *Agouti*, with which it corresponds in its tridactyle hinder extremities, it is distinguished by the number of the ribs and of the lumbar vertebræ, as well as by various other particulars of the osteology. In the *Helamys* there are five toes to the fore-feet, and four to the hinder. With the exception of this animal, of the Rabbit, and of the Jerboa, the tibia of *Lagostomus* exceeds in comparative length, that of any of the other *Mammalia* enumerated above.

One circumstance which has been noticed in the anatomical description is worthy of particular remark ;—the bony union of the radius and ulna in an animal, which, from the testimony of accurate observers, who saw it during its life, employed its anterior extremities in conveying its food to its mouth. This structure, so far as I am acquainted with the osteology of the *Mammalia*, is perfectly unique. It has been hitherto regarded as quite at variance with the existence of claviculæ, most of the quadrupeds

quadrupeds which use their paws for the purpose of hands depending in a great measure for the extent to which they can be so employed, on the perfection or deficiency of these bones, and on the rotatory motion of the radius on the ulna.

With the generic character, and with a few observations on the single species on which it is founded, I shall now conclude this paper.

LAGOSTOMUS.

Dentes incisores in utrâque maxillâ duo elongati, prominentes ; maxillæ inferioris canaliculati, paulò longiores.

—— *molares* in utrâque maxillâ utrinque quatuor, obliqui, antrorsùm extrorsùmque spectantes, coronâ simplici laminatâ ; maxillæ inferioris obliquiores bilaminati ; maxillæ superioris tres anteriores bilaminati, posticus trilaminatus.

Pedes antici breviores, digitis quatuor.

—— *postici* elongati, validi, digitis tribus : *ossa metatarsi* digitis numero æqualia.

Cauda mediocris, pilis longioribus pectinatis vestita.

Species unica.

LAGOSTOMUS TRICHODACTYLUS.

TAB. IX.

Dipus maximus. De Blainville. F. Cuvier, *Dict. des Scien. Nat.* xviii. p. 471.

To the original descriptions given from the living animal by M. de Blainville and by M. F. Cuvier it is necessary for me to add but little, their general correctness being shown by a reference to the stuffed skin. I have ventured to change the trivial name, as we are at present unacquainted with any congener with which a comparison could be made, and it would be improper to retain the epithet *maximus* for a single species. That which I have

have proposed, *trichodactylus*, is derived from a curious and hitherto unnoticed character, the animal being remarkable for a tuft of bristly hairs on the back of each of the hinder toes.

In one important particular the descriptions of the zoologists to whom I have referred differ materially. M. F. Cuvier states, that "la queue étoit de moyenne longueur, touffue et tout à fait relevée contre le dos:" while M. de Blainville remarks (*Desm., Enc. Méth. Mammalogie*, ii. 314.) "La queue du seul individu observé étoit tronquée et mutilée, et il en restoit environ deux pouces." For this discrepancy I can only account by supposing that the animal seen by the former naturalist was not the same as that described by the latter. Mr. Cross, I believe, received a pair of these animals at the same time, one of which escaped from his cage and was lost. The individual in question was skinned and stuffed by Mr. Leadbeater, who delivered the recent body to me; and it is obvious that the tails of the skin and that of the skeleton correspond with regard to length, *i. e.* five or six inches. In the stuffed specimen the tail is bushy, of a darker colour than that which prevails over the body, and having the hairs spread laterally, pectinated similarly to those of a *Myoxus*, or of a common Squirrel.

The size of the *Lagostomus trichodactylus*, as described by M. de Blainville and M. F. Cuvier, is that of a full-grown Rabbit of moderate dimensions. This, although sufficiently accurate, and as correct as the dimensions of any active and savage animal can be estimated while it is living, is by no means sufficiently precise. I therefore subjoin some of the more important measurements of the skeleton, which I give in preference to those of the skin.

	Feet.	Inches.
From the atlas to the tuber ischii	1	0 $\frac{1}{2}$
———— crista ilii to the tuber ischii	0	4
Length of the fore extremity from the head of the os brachii to the end of the longest nail	0	6
———— from the head of the os brachii to the ex- ternal condyle	0	2 $\frac{1}{4}$
———— from the end of the olecranon to that of the longest nail	0	4 $\frac{1}{2}$
———— of the hinder extremity	1	0 $\frac{1}{2}$
———— from the trochanter major to the lower portion of the external condyle of the femur	0	3 $\frac{1}{2}$
———— from the upper surface of the tibia along the fibula to the malleolus externus	0	4 $\frac{1}{2}$
———— from the end of the os calcis to the ex- treme end of the middle toe	0	4 $\frac{1}{8}$

The occipital diameter of the cranium of the *Lagostomus* is 1 inch and $\frac{4}{8}$ ths, and its diameter between the ascending portions of the zygoma 1 inch and $\frac{5}{8}$ ths. The corresponding measurements in the *Dipus* are respectively $\frac{7}{8}$ ths and $\frac{4}{8}$ ths of an inch.

EXPLANATION OF TAB. IX.

- Fig. a. *Lagostomus trichodactylus*,
 b. Skeleton of the same,
 c. Upper jaw,
 d. Under jaw,
 e. Crown of the second molar tooth of the
 left side of the lower jaw,
 f. Ditto of the last molar tooth of the right
 side of the upper jaw,
- } Half the Natural size.
 }
 } Natural size.